

Life in the Intertidal Zones

Teacher Packet

Program: A third through fifth grade program about the variety of life in the rocky intertidal zones.

Capacity: Thirty-five students. One adult per four students.

Time: One hour. 9:45-10:45am or 11:00am-12:00pm

Meeting Location: Meet at the bulletin board in the tidepool parking lot.

Park Theme to be Interpreted: The splash, high, middle and low zones in rocky intertidal areas are home to a multitude of life. Plants, animals and other organisms that live in the intertidal must have special adaptations to survive in this ever-changing habitat.

Objectives: At the completion of this program, students will be able to:

1. Describe two characteristics of the tidepool ecosystem.
2. Describe an intertidal animal and its adaptations
3. Choose one tidepool species and compare the population at two different sites making inferences about the tolerance of that species for air and water.

Science Content Standards for California Grades K-12

Grade 3: 3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

- b. Students know **examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.**
- c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
- d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to a new locations.

Grade 4: 3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

- a. Students know **ecosystems can be characterized by their living and nonliving components.**
- b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

Grade 5: 6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept, students should

develop their own questions and perform investigations. Students will:

- a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.

THE PROGRAM

Vehicle transportation is necessary to reach the tidepool area, as there is no sidewalk between the upper area of the monument and the tidepool area. **If you plan to visit the lighthouse or visitor center or see a movie in the auditorium, you must have transportation available for the duration of your visit.**

Please arrive at least 10 minutes before the ranger program so that you will be ready to start on time. From the parking lot, the ranger will walk the class down the trail a short distance where they will spend about 15 minutes talking about intertidal animals and their habitat.

Students will work in small groups to study two areas of the tidepools. They will identify the creatures in their plots and discuss the creatures' adaptations, similarities, and differences. If parents are available for each group that is fine, but since the students will be conducting the learning experience themselves, one adult can supervise two groups. **The goal of the field experience is to allow the students to become familiar with this extraordinary region and its life by using observation and recording techniques.**

SAFETY

Make sure the students are dressed warmly, and are wearing **sturdy shoes with good rubber soles**. The rocks are slippery! You may want to bring **sunscreen, sunglasses, and a hat** as well.

TIDEPOOL FACTS!

- The tides cover and expose the rocks and beaches every day.
- **Rocks** provide a hospitable environment in which many animals and plants make their homes. They may live on or under the rocks, or they may live in a pool formed by the rocks.
- In exposed areas, the animals have to withstand the **force of the waves** as well as **desiccation** (drying out) during the low tides.
- Pool areas may not receive water for many days and consequently dry up or become very salty as the water evaporates.
- At **low tide**, organisms will be left exposed, high and dry, until the next high tide. As waste products accumulate, the area becomes increasingly hostile. Yet the creatures persist.
- An intertidal animal or plant has special characteristics to live successfully in this environment. These survival techniques are called **adaptations**.
- **Three zones** can be seen in the tidepool area. The distinguishing organisms are distributed based on their ability to tolerate exposure to the air.
 - In the **high intertidal** the animals that are closer to the cliffs receive a tidal flushing only during the highest of the tides, perhaps only twice a month during the full and new moon period.
 - In the **middle zone** the animals will be inundated roughly twice a day.
 - In the **low intertidal** area the creatures are underwater the majority of the time.

SOURCES FOR MORE INFORMATION

Birch Aquarium at Scripps website: <http://aquarium.ucsd.edu/index.cfm>

Diving Into Oceans. Ranger Rick's Nature Scope, National Wildlife Federation - Lesson Ideas
Life at the Edge of the Sea. Malnig, Anita – Science trade book for children.